*Document must contain approved signatures for validity

SDL Shielding Checklist

Revised September 23, 2004

Running the checklist:

There are 19 check stations with several items inside of each. Start the inspection from the gun hutch and work down the outside aisle to the linac dump. Then proceed along the south side of NISUS. The first 12 stations are found on this side of the accelerator. Go through the FEL dump walk-under and proceed around to the north side of the machine to check the remaining four stations. The final station inside the enclosure is at the chicane on the outside wall of the building. Outside the enclosure are the 5 klystrons. The last check station is on the outside of the enclosure at the west end, where the FEL light is extracted. Refer to the attached drawing for the locations of the stations and photographs.

- ❑ Station 1: Electron Gun Hutch
  - ❑ 1.1 Gun enclosure cover lead installed and banded into place
  - ❑ 1.2 Lead wall downstream of gun in place and appearing as in photograph
  - ❑ 1.3 Lead wall on waveguide side of gun installed as in photograph
  - ❑ 1.4 Lead curtain walls raised

- ❑ Station 2: Linac Accelerating Tank 1
  - ❑ 2.1 11 cast lead shield covers in place as in photograph
  - ❑ 2.2 Lead bricks on top of cast shields banded in place as in photograph (2 places)

- ❑ Station 3: Linac Accelerating Tank 2
  - ❑ 3.1 12 cast lead shield covers in place as in photograph
  - ❑ 3.2 Lead bricks on top of cast shields banded in place as in photograph (3 places)

- ❑ Station 4: Compressor shielding enclosure, Aisle side
  - ❑ 4.1 7 Cast lead shielding components bolted onto stand and appearing as in photograph

- ❑ Station 5: Linac Accelerating Tank 3
  - ❑ 5.1 12 cast lead shield covers in place as in photograph
  - ❑ 5.2 Lead bricks on top of cast shields banded in place as in photograph (4 places)

Continue with Stations 6 through 18

- ❏ Station 6: Linac Accelerating Tank 4
  - ❏ 6.1 14 cast lead shield covers in place as in photograph
  - ❏ 6.2 Lead bricks on top of cast shields banded in place as in photograph (3 places)

- ❏ Station 7: Transport line (downstream of linac tank 4)
  - ❏ 7.1 4 cast lead shield covers in place as in photograph
  - ❏ 7.2 Large cast lead cover in place as shown in photograph
  - ❏ 7.3 Lead bricks on top of cast shields banded in place as in photograph (3 places)
  - ❏ 7.4 Lead bricks on top of cast shields banded in place as in photograph (2 places)

- ❏ Station 8: Transport line shielding enclosure, Aisle side
  - ❏ 8.1 Cast plate comprising end wall of enclosure as in photograph
  - ❏ 8.2 5 cast plates comprising inside wall of enclosure installed on stands as in photograph
  - ❏ 8.3 Lead brick attached to side plate at joint as in photograph
  - ❏ 8.4 6 cast plates comprising enclosure roof installed as in photograph
  - ❏ 8.5 Borated polyethelene sheets (11) in place
  - ❏ 8.6 Lead bricks (2) on enclosure roof

- ❏ Station 9: Linac Beam dump
  - ❏ 9.1 Steel blocks appearing as in photograph. Not visible behind steel blocks are stacked lead bricks, banded in place. If disturbed, re-stack as found.
  - ❏ 9.2 Concrete shield blocks in place
  - ❏ 9.3 12” stack of borated polyethylene in place as in photograph

- ❏ Station 10: Matching section into NISUS undulator
  - ❏ 10.1 2 cast plates comprising wall of enclosure as in photograph
  - ❏ 10.2 Lead door closed as in photograph
  - ❏ 10.3 Lead joint covers in place
  - ❏ 10.4 3 Lead plates forming complete cover for the shielding
  - ❏ 10.5 Borated polyethylene end cover (8 inches thick)
  - ❏ 10.6 Lead bricks, stacked as in photos

- ❏ Station 11: South side of NISUS
  - ❏ 11.1 5 Borated Polyethylene covers in place as indicated. The red tape marks on the overhead rails define the location for the trolleys.
  - ❏ 11.2 Lead inserts (top and bottom) in place at all 16 segments of the undulator as in photograph

- ❏ Station 12: FEL Beam transport and Beam Dump
  - ❏ 12.1 Lead door in place and closed
  - ❏ 12.2 2 precast side panels in place
  - ❏ 12.3 4 precast lead covers over enclosure as in photograph
  - ❏ 12.4 Shielding blocks stacked and banded as in photograph. If removed, there are 6 cast lead U-channels covering transport line
  - ❏ 12.5 Lead beam stop for beam dump in place
  - ❏ 12.6 Borated Polyethylene sheets in place (12)
  - ❏ 12.7 Lead end plate on enclosure as in photo

Continue with Stations 13 through 18

- ❏ Station 13: North/West side of FEL transport enclosure

- ❑ 13.1 4 cast plates comprising wall of enclosure as in photograph
- ❑ 13.2 Lead and cement block shielding at wall as in photograph
- ❑ 13.3 Lead door in place and closed
- ❑ 13.4 Borated Poly end cover for NISUS (white material 12 " thick)

❑ Station 14: North Side of NISUS
- ❑ 14.1 5 Borated Polyethylene covers in place as indicated. The red tape marks on the overhead rails define the location for the trolleys.
- ❑ 14.2 Lead inserts (top and bottom) in place at all 16 segments of the undulator as in photograph

❑ Station 15: North Side of Matching Section
- ❑ 15.1 Seven (7) cast plates comprising side walls in place on stands
- ❑ 15.2 Hinged door shield at Nissus in place and closed

❑ Station 16: North Side of Bunch Compressor
- ❑ 16.1 Two cast plates comprising side walls in place on stands
- ❑ 16.2 Door for compressor shield in place and closed

❑ Station 17: Outside enclosure on South wall
- ❑ 17.1 Klystron A lead shielding as shown in photograph
  - ❑ 17.1.1 Cap piece
  - ❑ 17.1.2 Anode cylinder
  - ❑ 17.1.3 Collar
  - ❑ 17.1.4 Magnet cylinder
  - ❑ 17.1.5 Back and Side plates
  - ❑ 17.1.6 Lead bricks (2)
  - ❑ 17.1.7 Wiring connection shield
- ❑ 17.2 Klystron B lead shielding as shown in photograph
  - ❑ 17.2.1 Cap piece
  - ❑ 17.2.2 Anode cylinder
  - ❑ 17.2.3 Collar
  - ❑ 17.2.4 Magnet cylinder
  - ❑ 17.2.5 Back and Side plates
  - ❑ 17.2.6 Lead bricks (2)
  - ❑ 17.2.7 Wiring connection shield
- ❑ 17.3 Klystron C lead shielding as shown in photograph
  - ❑ 17.3.1 Cap piece
  - ❑ 17.3.2 Anode cylinder
  - ❑ 17.3.3 Collar
  - ❑ 17.3.4 Magnet cylinder
  - ❑ 17.3.5 Back and Side plates
  - ❑ 17.3.6 Lead bricks (2)
  - ❑ 17.3.7 Wiring connection shield

Continue with Stations 17.4 through 18

- ❑ 17.4 Klystron E lead shielding as shown in photograph
  - ❑ 17.4.1 Cap piece

- ❏ 17.4.2 Anode cylinder (2 pieces)
- ❏ 17.4.3 Collar (2 pieces)
- ❏ 17.4.4 Magnet cylinder (1 piece)
- ❏ 17.4.5 Wiring connection shield (large)
- ❏ 17.4.6 Wiring connection access plate
- ❏ 17.4.7 Pickup Box
- ❏ 17.4.8 Magnet top plate (2-pc's)

❏ Station 18: Outside West End of Enclosure
- ❏ 18.1 Lead plate in place as shown

❏*All checklist items completed*

Revision Log

Revision released 09/23/2004